

**REMARKS**

Claims 1-7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Song et al. (US 2002/0130324).

Claims 1-7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kim et al. (US 2003/0085404).

Claims 1 and 2 stand rejected under 35 U.S.C. § 112, first paragraph.

The specification is objected to for minor informalities.

**Summary of the Response to the Office Action**

Applicants have amended claims 1, 2, and 15-17 to further define the invention, and canceled claim 7. Accordingly, claims 1-6 and 15-20 are pending for further consideration, with claims 8-14 being withdrawn from consideration.

**Objection to the Specification**

The specification is objected to for minor informalities. Specifically, use of the phrase “the transparent electrode material,” as recited by claims 16 and 17, is allegedly not sufficiently supported by the specification. Accordingly, Applicants have amended claims 16 and 17 to recite “the transparent electrode.” Thus, Applicants respectfully submit that the features recited by claims 16 and 17 is sufficiently supported by the specification, and respectfully request that the objection to the specification be withdrawn.

**All Claims Comply with 35 U.S.C. 112**

Claims 1 and 2 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Accordingly, Applicants have amended claims 1 and 2 in accordance with the Examiner’s comments. Thus, Applicants respectfully

submit that claims 1 and 2, as presently amended, comply with the written description requirement, and respectfully request that the rejection of claims 1 and 2 under 35 U.S.C. § 112, first paragraph, be withdrawn.

**All Claims Define Allowable Subject Matter**

Claims 1-7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Song et al. (US 2002/0130324), and claims 1-7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kim et al. (US 2003/0085404). Applicants respectfully traverse these rejections as being based upon prior art references that neither teach nor suggest the novel combination of features recited in independent claims 1 and 15, as amended, and hence dependent claims 2-6 and 16-20.

Independent claim 1, as amended, recites, in part, gate conductive lines each comprising “a first metal layer formed from a first metal,” and “a heat generated alloy layer formed from an alloy of the first metal and another metal is disposed at an upper portion of the first metal layer.” Similarly, independent claim 15, as amended, recites “wherein the gate electrode and the gate pad both include a first layer formed of a first metal and a second layer formed of a heat generated alloy of the first metal and a second metal disposed at an entire upper surface of the first layer directly contacting the transparent electrode.”

In contrast to Applicants’ claimed invention, Song et al. merely teaches (paragraphs [0079] and [0111]) gate wires 22, 24, and 26 have a dual-layered structure including a lower layer made of a material having low resistivity, such as aluminum and aluminum-neodymium, and an upper layer made of a material having good contact with other materials, such as molybdenum-tungsten alloy. Moreover, Kim et al. merely teaches (paragraph [0043]) gate wire parts 22, 24, 26, and 28 have multiple-layered structure including one layer made of a material

having a low resistivity and another layer is made of a material having good contact properties with other materials. Specifically, Kim et al. teaches using a double layer structure including Cr/Al (or Al alloy) and Al/Mo as examples. Thus, Song et al. and Kim et al. both teach using two distinctly different material layers having no commonly shared material(s). Independent claims 1 and 15 require a first layer and an alloy layer on an upper portion of the first layer such that the alloy layer is formed from an alloy of the first layer. According to independent claims 1 and 15, the alloy layer and the first layer must share at least one common material, wherein Song et al. and Kim et al. both teach using two distinctly different materials.

According to the present invention, high contact resistance between aluminum/aluminum alloy material(s), which are used to form gate conductive lines, and ITO material(s), which are used to form transparent electrodes, may be reduced by forming a heat generated alloy layer on the gate conductive lines. Specifically, an alloying layer may be deposited onto and thermally diffused into the aluminum/aluminum alloy material of the gate conductive lines. Then, even if the alloying layer is subsequently removed, the heat generated alloy may remain on an upper portion of the aluminum/aluminum alloy material of the gate conductive lines. Thus, high contact resistance between the material of the gate conductive lines and subsequently-formed ITO material may be significantly reduced.

For at least the above reasons, Applicants respectfully submit that claims 1-6 and 15-20 are neither taught nor suggested by either of Song et al., and Kim et al. Applicants respectfully assert that the rejections under 35 U.S.C. §102(e) should be withdrawn because the above-discussed novel combinations of features are neither taught nor suggested by any of the applied references.

**Conclusion**

In view of the foregoing, Applicants respectfully requests reconsideration and timely allowance of the pending claims. Should the Examiner believe that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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